Remarks

REJECTIONS UNDER 35 U.S.C., § 112, SECOND PARAGRAPH

Claims 31 and 35 stand rejected under 35 U.S.C., 112, second paragraph. Applicants respectfully request that the Examiner reconsider the rejection.

The controversy appears to be based on the Examiner's understanding that the short-chain cosurfactants useful in the practice of the present invention are, in fact, surfactants or detergents. The Examiner states that ethylene glycol monopropyl ether has a surface tension of 26.3 dynes/cm at 25°C.

Applicants respectfully submit that the rejection is based on the Examiner's misunderstanding of materials which are surfactants, detergents, wetting agents and emulsifiers. Applicants herewith submit page 1108 from Hawley's Condensed Chemical Dictionary, 12th edition, Richard J. Lewis, Sr. Editor.

At page 1108, surface-active agent (surfactant) is defined as "Any compound that reduces surface tension when dissolved in water or water solutions, or which reduces interfacial tension between two liquids, or between a liquid and a solid. There are three categories of surface-active agents: detergents, wetting agents, and emulsifiers; all use the same basic chemical mechanism and differ chiefly in the nature of the surfaces involved. See under these three entries for further information. See also interface, surface chemistry."

Surface chemistry is also set forth at page 1108.

At page 1109, Hawley's Condensed Chemical Dictionary describes the phenomenon known as surface tension. However, the surface tension of the liquid bears no relation to whether it is a surfactant, detergent, wetting agent or emulsifier. The surface tension of a particular liquid is merely a function of its molecular structure and not whether it reduces the surface tension of water and would be known as a surfactant. Applicants therefore respectfully submit that the Examiner's statement at page 2, lower half of the page, which states:

> "The applicant also asserts that surfactants have a surface tension below 45 dynes/cm. The surface tension of ethylene glycol monopropyl ether is

> 26.3 dynes/cm at 25°C. This also seems to meet the applicant's definition."

Applicants submit that they did not intend to imply that the surface tension of a liquid would bear any relation to whether it was a surfactant, detergent, emulsifier or a wetting agent. The fact that a compound has a low surface tension bears no relation to whether it lowers the surface tension of water. Applicants invite the Examiner's attention to page 1109 of Hawley's Condensed Chemical Dictionary to the section marked "surface tension" which teaches that benzene has a surface tension of 29 dynes/cm, ethanol has a surface tension of 22.3 dynes/cm. Clearly, neither of these compounds are considered detergents or surfactants in the art.

It is clear from page 1108 of Hawley's Condensed Chemical Dictionary that surfactant is a broader term than detergent but that they both share the same characteristic that they lower the surface tension of water.

Applicants submit that the Examiner has not provided any reference or disclosure which would lead one skilled in the art to expect that compounds such as ethylene glycol monopropyl ether would lower the surface tension of water when mixed therewith. Applicants respectfully request that the Examiner provide some reference which teaches that ethylene glycol monopropyl ether is a surfactant or detergent and, in fact, has a substantial surface tension lowering effect when mixed with water. Applicants respectfully submit that the Examiner's position in regard to compounds such as ethylene glycol monopropyl ether is mere supposition and speculation and bears no relation to what one skilled in the art would understand.

Further, Applicants invite the Examiner's attention to VanEenam (U.S. 5,080,831) at column 5, lines 36-42, which describes the activity of the coupler useful in the practice of the invention. VanEenam at column 6, line 60 though column 7, line 28, discloses the list of useful couplers and their function in the composition. Applicants respectfully submit that the teachings of VanEenam would teach one skilled in the art away from expecting that the couplers could be considered as surfactants or detergents.

Since VanEenam does not teach nor suggest that the couplers are surfactants or lower the surface tension of water, Applicants respectfully request that the Examiner

reconsider the rejection under 35 U.S.C. 112, second paragraph, of claim 31 and 35 under 35 U.S.C. 112, second paragraph.

REJECTIONS UNDER 35 U.S.C. 102(b)

Claims 1-35 stand rejected under 35 U.S.C. 102(b) as anticipated by VanEenam (U.S. 5,080,831). Applicants respectfully submit that VanEenam neither teaches nor suggests the present invention and, in fact, teaches away from the present invention.

VanEenam discloses and claims a stable, aqueous cleaner/degreaser composition in the form of a water-soluble solution comprising (a) at least one sparingly water-soluble organic solvent having a water-solubility in the range of approximately 0.2 to approximately 6 weight percent. Applicants respectfully submit that the solvents useful in the practice of the invention are not sparingly water-soluble as required in VanEenam. That is, C_{1-4} alkyl esters of C_{6-22} saturated or unsaturated carboxylic acids are water-insoluble materials. This can clearly be seen from VanEenam wherein at column 4, lines 22-31 certain esters of carboxylic acids are disclosed with their water-solubility. At line 31, n-butyl acetate is disclosed as having a solubility of 0.7 weight percent, n-amyl acetate has a water solubility of 0.25 weight percent. Since all of the esters useful in the practice of the present invention contain at least 6 carbon atoms in the acid group, all of the esters useful in the practice of the present invention have a solubility in water of less than 0.2 % by weight. Again, the rejection appears to be based on the Examiner's speculation in relation to the water-solubility of the esters useful in the VanEenam composition. If the Examiner maintains the rejection, applicants request that some date concerning the solubility of esters useful in the present invention be provided. The Merck Chemical Index indicates that all of the esters useful in the present invention are water insoluble.

Applicants respectfully submit that to be a reference under which a rejection under 35 U.S.C. 102(b) can be based, the reference must disclose each and every limitation in the claims. Applicants submit that VanEenam fails as a reference in that it neither teaches nor suggests utilizing water insoluble organic solvents; that is, solvents

which have a solubility in water less than 0.2 % by weight. VanEenam teaches away from the present invention.

In addition, Applicants submit that VanEenam would teach one skilled in the art away from a composition containing the C_{1-4} alkyl ester of a C_{6-22} saturated or unsaturated carboxylic acid and a cyclic ketone. VanEenam teaches at column 7, lines 29-36, that mixtures of sparingly soluble solvents can be utilized. However, if a mixture of solvents is to be used, each of the solvents should have nearly the same approximate water-solubility so that they will solubilize in water at approximately the same point upon addition of the solubilizing additive. Clearly, the water insoluble esters of the present invention and cyclohexanone, water solubility 2.3% by weight would not form a mixture which is useful in the VanEenam composition.

Applicants respectfully submit that VanEenam fails as a reference under which a rejection under 35 U.S.C. 102(b) can be based in that VanEenam requires that the solvent be sparingly soluble in water and would not teach or suggest use of the water insoluble alkyl esters useful in the practice of the present invention or the mixture with a cyclic ketone. Applicants therefore respectfully submit that the rejection of the claims under 35 U.S.C. 102(b) over VanEenam is untenable and respectfully request that the rejection be reconsidered and withdrawn. Favorable reconsideration of the claims is respectfully requested.

Respectfully submitted,

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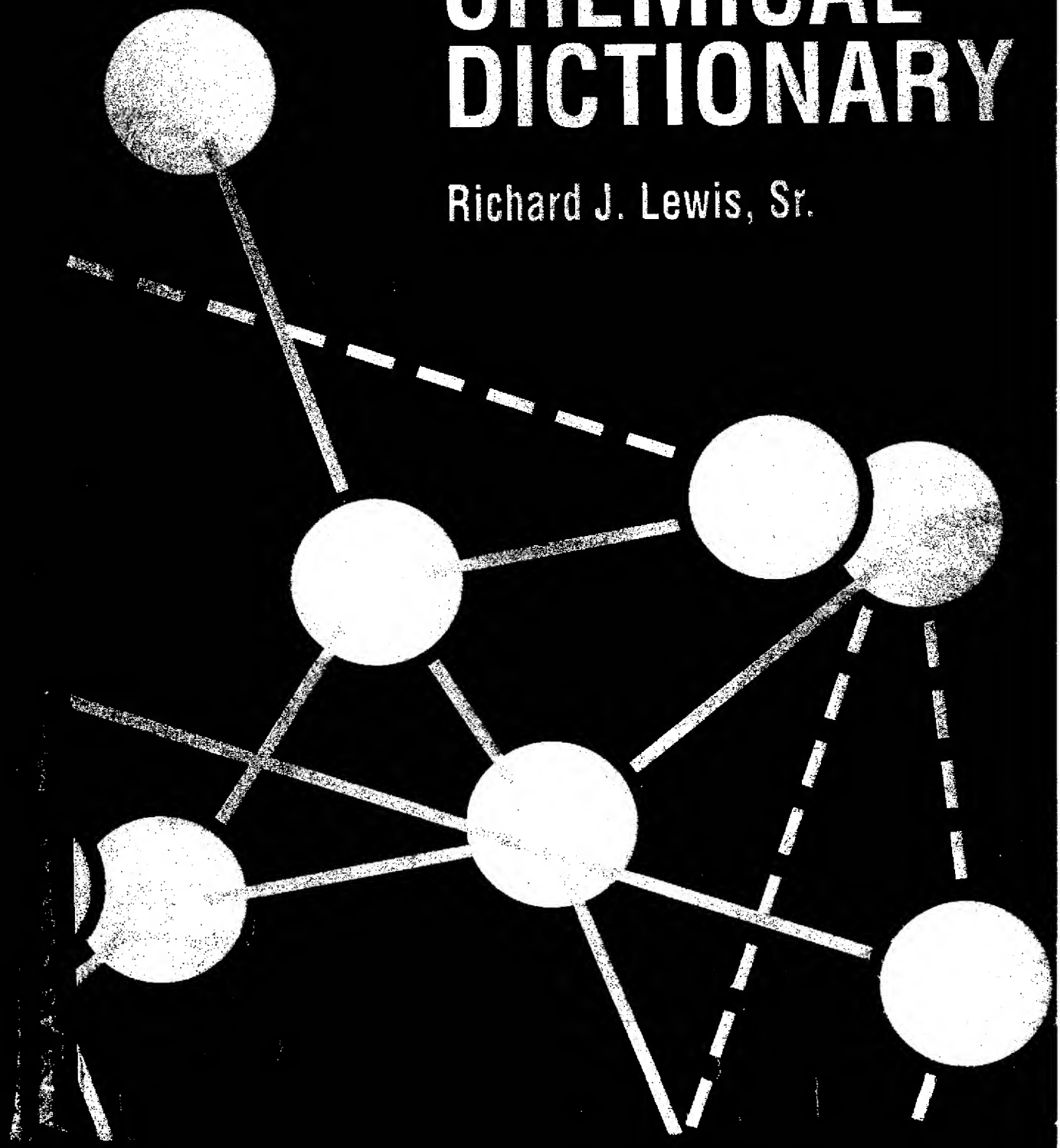
Enc. : Pages 1108 and 1109, HAWLEYS' CONDENSED CHEMICAL DICTIONARY

Hawley's
CONDENSED CHEMICAL DICTIONARY

Twelfth Edition

Richard J. Lewis, Sr.



Typical analysis: Moisture 10–15%, available phosphoric acid (as P_2O_5) 18–21%, insoluble phosphoric acid 0.3–2%, total phosphoric acid (as P_2O_5) 19–23%.
Grade: Based on available P_2O_5.
Use: Fertilizer.
See also triple superphosphate and nitrophosphate.

superphosphoric acid. See polyphosphoric acid.

supersaturation. The condition in which a solvent contains more dissolved matter (solute) than is present in a saturated solution of the same components at equivalent temperature. Such solutions may occur, or can be made, when a saturated solution cools gradually so that nucleating crystals do not form. They are extremely unstable and will precipitate upon addition of even one or two crystals of the solute or upon shaking or other slight agitation. Supersaturated solutions occur in the confectionery industry, e.g., in fudges, maple sugar, etc.

"Supersheen" [*Allied-Signal*]. TM for caustic soda solution containing chelating agent and wetting agent.
Hazard: Strong irritant to skin and tissue.
Use: Bottle washing and food plant sanitation.

"Super-Sta-Bac" [*Reichhold*]. TM for hydrocarbon resins which are polymers of mixed olefins.

"Supracets" [*Holliday*]. TM for disperse dyes.
Use: Primarily on acetate and polyamide materials.

"Supralan" [*BASF*]. TM for metallized acid colors of good fastness and level dyeing properties.

"Supramine" XA [*BASF*]. TM for a leather chemical, solubilized sulfur phenol condensate, 75% active.

"Supranol" [*BASF*]. TM for dyestuffs used on wool and silk; good fastness to light, washing, and sea water; can also be used on leather.

surface. In physical chemistry, the area of contact between two different phases or states of matter, e.g., finely divided solid particles and air or other gas (solid-gas); liquids and air (liquid-gas); insoluble particles and liquid (solid-liquid). Surfaces are the sites of the physicochemical activity between the phases that is responsible for such phenomena as adsorption, reactivity, and catalysis. The depth of a surface is of molecular order of magnitude. The term interface is approximately synonymous with surface, but it also includes dispersions involving only one phase of matter, i.e., solid-solid or liquid-liquid.
See also interface, surface area, surface chemistry.

surface-active agent. (surfactant). Any compound that reduces surface tension when dissolved in water or water solutions, or which reduces interfacial tension between two liquids, or between a liquid and a solid. There are three categories of surface-active agents: detergents, wetting agents, and emulsifiers; all use the same basic chemical mechanism and differ chiefly in the nature of the surfaces involved.
See under these three entries for further information. See also interface, surface chemistry.

surface area. The total area of exposed surface of a finely divided solid (powder, fiber, etc.), including irregularities of all types. Because activity is greatest at the surface, i.e., the boundary between the particle and its environment, the larger the surface area of a given substance, the more reactive it is. Thus, reduction to small particles is a means of increasing the efficiency of both chemical and physical reactions, e.g., the coloring effect of pigments is increased by maximum size reduction. Carbon black is notable among solids for its huge surface area (as much as 18 acres/lb for some types); the activity of its surface accounts for its outstanding ability to increase the strength and abrasion resistance of rubber. The capacity of activated carbon to adsorb molecules of gases is due to this factor. Surface area is measured most accurately by nitrogen adsorption techniques.

surface chemistry. The observation and measurement of forces acting at the surfaces of gases, liquids, and solids or at the interfaces between them. This includes the surface tension of liquids (vapor pressure, solubility); emulsions (liquid/liquid interfaces); finely divided solid particles (adsorption, catalysis); permeable membranes and microporous materials; and biochemical phenomena such as osmosis, cell function, and metabolic mechanisms in plants and animals. Surface chemistry has many industrial applications, a few of which are air pollution, soaps and synthetic detergents, reinforcement of rubber and plastics, behavior of catalysts, color and optical properties of paints, aerosol sprays of all types, monolayers and thin films, both metallic and organic. Outstanding names in the development of this science are Graham, Freundlich, and W. Ostwald in the 19th Century, and Harkins, Langmuir, LaMer, and McBain in the 20th.
See also colloid chemistry.

surface tension. In any liquid, the attractive force exerted by the molecules below the surface upon those at the surface/air interface, resulting from the high molecular concentration of a liquid compared to the low molecular concentration of a gas. An inward pull, or internal pressure, is thus created, which tends to restrain the liquid from flowing. Its strength varies with the chemical nature of the liquid. Polar liquids have high surface tension (water = 73 dynes/cm at 20C); non-polar liquids have much lower values (benzene = 29 dynes/cm, ethanol = 22.3 dynes/cm), thus, they flow more readily than water. Mercury, with the highest surface tension of any liquid (480 dynes/cm) does not flow, but disintegrates into droplets.
See also interface, surface-active agent.

surfactant. See surface-active agent.

"Surlyn" [*Du Pont*]. TM for a group of ionomer resins.
Properties: ("Surlyn" A) Thermoplastic produced as a granular material; flexible, transparent, grease-resistant; very lightweight but tough. Izod impact strength 5.7–14.6 ft-lb/in (higher than any other polyolefin), tensile strength 3500–5500 psi, elongation 300–400%, softening point 71C, insoluble in any commercial solvent, subject to slow swelling by hydrocarbons, to slow attack by acids.
Use: Coatings, packaging films, products made by injection or blow molding, or by thermoforming.

SUS. Abbreviation for Saybolt Universal Seconds.
See Saybolt Universal viscosity.

suspension. A system in which very small particles (solid, semi-solid, or liquid) are more or less uniformly dispersed in a liquid or gaseous medium. If the particles are small enough to pass through filter membranes, the system is a colloidal suspension (or solution). Examples of solid-in-liquid suspensions are comminuted wood pulp in water, which becomes paper on filtration; the fat particles in milk; and the red corpuscles in blood. A liquid-in-gas suspension is represented by fog or by an aerosol spray. If the particles are larger than colloidal dimensions, they will tend to precipitate if heavier than the suspending medium, or to agglomerate and rise to the surface if lighter. This can be prevented by incorporation of protective colloids. Polymerization is often carried out in suspension, the product being in the form of spheres or beads.
See also solution, colloidal; dispersion; emulsion; colloid chemistry.

Svedberg, Theodor. (1884–1971). A Swedish chemist who won the Nobel prize in 1926. Author of *Die Methoden zur Herstellung Kolloider Losungen anorganischer Stoffe*. His work included research in colloidal chemistry, molecular-size determination, and methods of electrophoresis as well as the development of the ultracentrifuge for separation of colloidal particles in solution. His education was in Sweden with later work done at the University of Wisconsin before his return to Uppsalla.

Swarts reaction. Fluorination of organic polyhalides with antimony trifluoride (or zinc and mercury fluorides) in the presence of a trace of a pentavalent antimony salt.

sweeten. (1) To add sugar or a synthetic product to foods or beverages to provide a sweet taste (flavor). (2) To deodorize and purify petroleum products by removing sulfur compounds (doctor treatment). (3) In industrial slang, to increase the quality of a low-cost product by adding more expensive ingredients.

sweetener, nonnutritive. A food additive, either natural or synthetic, usually having much greater sweetness intensity than sugar (sucrose), but without its caloric value. In some cases, they act as enhancers or potentiators of sweetness. Chief among them is saccharin, a benzoic acid derivative. The cyclamate group was removed from the market by the FDA in 1970 because of animal carcinogenicity, though the evidence in respect to human toxicity is controversial.
Increasing research has developed several new noncaloric sweeteners: the dihydrochalcone group of disaccharides, glycyrrhizin (licorice extract), especially its ammoniated derivative, dulcin (4-ethoxyphenylurea) the glycoprotein of "miracle fruit," and a polypeptide from a tropical fruit called the "serendipity berry" said to be 3000 times sweeter than sucrose. "Aspartame" ($C_{14}H_{18}N_2O_5$) has been approved by the FDA.

sweet oil. See olive oil.

sweet water. (1) The glycerin-and-water mixture obtained when fats are split (or hydrolyzed) with water to give fatty acid and glycerin. (2) The washings from char used in sugar refining. (3) In engineering terminology, plain water cooled to just below the freezing point and used to preserve milk and other food products.

swep. (generic name for methyl-3,4-dichlorocarbanilate; methyl-n-3,4-dichlorophenylcarbamate). $CH_3OOCNHC_6H_3Cl_2$.
Properties: Crystals, mp 113C, insoluble in water and kerosene, soluble in acetone and dimethylformamide.